

CIA/ER/S-6716-A-75

MEMORANDUM FOR: St/P/C

The attached report was prepared in line with an oral request by Mrs. Evelyn Colbert, NIO/Japan/Pacific. The information is for use in preparing an inter-agency memorandum on South Korea's nuclear capability. The attached report includes material prepared by U/RE. Meetings on the report being drafted by the NIO will be held on 14 January 1975.

Chief, [redacted]

[Signature]
(DATE)

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9 January 1975

MEMORANDUM FOR: Mrs. Evelyn Colbert
NIO/Japan/Pacific

SUBJECT : South Korean Economy and
Nuclear Capability

In response to your request we are forwarding
the attached information on the South Korean Economy
and Nuclear Capability. If any further information
on this or related subjects is needed, we will be
happy to oblige.

[Redacted]

Chief, [Redacted] Branch
[Redacted] Division
Office of Economic Research

Attachment:
As stated

Distribution: (S-6716)
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(9 Jan 75)

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SOUTH KOREA'S ECONOMY AND NUCLEAR CAPABILITY

South Korea's nuclear development program has thus far been extremely limited and expenditures small. Spending by the Atomic Energy Research Institute during 1959-73 totaled about \$21 million and currently is running about \$2 million annually. Seoul, however, is planning an ambitious program over the next 7 years and costs will rise rapidly. Present planning calls for a more-than-doubling of installed electric power capacity by the end of 1981, at which time nuclear power is to provide about 25% of total power generation. The total cost of the program (in 1974 prices) is projected to approach \$3 billion, with about half the total going to nuclear expenditures. Seoul has estimated that the nuclear plants should provide savings from oil imports of about \$250 million annually by the early 1980's.

The initial stages of this power development plan are underway. A 600 MW Westinghouse pressurized water reactor has been under construction at a site near Pusan since March 1971. Scheduled for completion in 1976, the reactor is to cost about \$250 million. A second reactor of the same size and for the same site was recently ordered from Westinghouse at a cost of \$465 million and is scheduled for operation in 1979. Agreement for purchase of a 600 MW natural uranium

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fueled, heavy water moderated, CANDU reactor from Canada at a cost of some \$400 million was reached at the end of December. The \$1.1 billion cost of these power reactors is being financed almost entirely by foreign loans.

By duplicating the CANDU reactor South Korea, in theory at least, could undertake a major nuclear weapons program. Such a reactor could produce the needed plutonium for use outside the bounds of international safeguards. The necessary capital investment for reactor, heavy water plant, fuel fabrication facilities, and a chemical reprocessing plant would exceed half a billion dollars. A similar amount would be required for procuring safeguard-free uranium to fuel the reactor, operating the facilities to separate out plutonium, and conducting the necessary weapons R&D. The entire cost would have to be domestically financed. Seoul would also risk loss of foreign financing of any nuclear plants beyond those now committed.

Seoul could develop a small-scale nuclear weapon capability in less expensive ways. The effort would be aimed at producing only enough plutonium for a small number of weapons. A small nuclear reactor using natural uranium fuel could perhaps be designed and constructed without access to a CANDU prototype. A program to produce one or two weapons per year, probably would cost around \$200 million prior to the testing of an initial device. This figure would include

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capital investment on the order of \$50 million for research, production and testing facilities, and some \$150 million in operating expenses.

A small-scale program would place few strains on Korea's economy or financial resources. The required \$200 million in outlays spread over several years would be extremely small compared to Seoul's annual defense spending of about \$1 billion and total government spending of \$2.8 billion a year. A larger program, involving construction of one CANDU-type reactor, could probably be financed, although with much greater difficulty. Such a program, stretched over ten years, would represent outlays equal to about 1% of GNP and 4% of total government spending.

Technological problems are the most serious constraints on undertaking a nuclear weapons program. If the decision to go ahead with a small program were made, however, the difficulties could probably be overcome, although perhaps not before the mid-1980's. While Korea has a relatively well developed industrial base, it has practically no first-hand experience with the construction of nuclear facilities. A shortage of personnel trained in all aspects of nuclear research, development, and weapons design would also hamper early progress. South Korea's domestic uranium sources, though probably not economically exploitable at current world prices, could still be mined with government subsidies.

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Going ahead with a major program -- by duplicating the CANDU-reactor -- would almost certainly require a 10 year or longer period. Construction of the Canadian CANDU plant will not be completed until 1990 and at the very least 5 years would be required for its duplication. Even with Canadian assistance, it took India eight years to accomplish the same thing.

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